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ABSTRACT

Candidates taking the Test of English as a Foreign Language (TOEFL) are currently asked to supply several items of background information: birth date, sex, number of times TOEFL has been taken before, whether they are seeking status as undergraduate or graduate students, their native country and native language, and (for prospective graduate students only) their intended field of study. The candidates provide this information on one side of their answer sheet, according to instructions given in the handbook sent to each candidate upon registration. In view of the extreme heterogeneity of the TOEFL candidate population it seems likely that additional information would be valuable. Foreign students (39 undergraduate and 18 graduate) were interviewed at four institutions. Four variables emerged as being the most promising: total number of years of formal study of English; reading of English-language newspapers, books, and magazines; number of years of father's education; and number of years of mother's education. Collectively, these variables offer the promise of enhanced research on various aspects of the TOEFL candidate population and on foreign students generally. The appendices include the interview questions used in the study, as well as interviewees' comments on TOEFL. (PN)

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RESEARCH REPORT

AN INQUIRY INTO POSSIBLE NEW ITEMS OF BACKGROUND INFORMATION ABOUT TOEFL CANDIDATES

Robert A. Feldmesser

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AN INQUIRY INTO POSSIBLE NEW ITEMS OF BACKGROUND INFORMATION ABOUT TOEFL CANDIDATES

Robert A. Feldmesser

In the conduct of a large-scale standardized testing program, it is frequently useful to have information about the characteristics of the candidates who take the test. Such information can help program sponsors, test users, and the candidates make sounder interpretations of test scores and test-item responses, and it can also alert program sponsors to needs for change in the services offered; help inform the educational community about the nature of the population taking the test; and provide a body of basic data to facilitate research on such matters as conditions conducive to high scores, trends in scores over time and among various groups, relationships among candidates taking several different tests, the flow of students into and through educational institutions, and other topics that cannot be anticipated.

Candidates taking the Test of English as a Foreign Language (TOEFL) are currently asked to supply several items of background information: birth date, sex, number of times TOEFL has been taken before, whether they are seeking status as undergraduate or graduate students, their native country and native language, and (for prospective graduate students only) their intended field of study. The candidates provide this information on one side of their answer sheet, according to instructions given in the handbook sent to each candidate upon registration. This information is often helpful for the purposes mentioned above, but--especially in

view of the extreme heterogeneity of the TOEFL candidate population (Wilson, forthcoming [a,b])--it seems likely that additional information would be valuable. This study was undertaken to explore the kinds of information that (a) were perceived as potentially helpful by persons professionally concerned with foreign students, (b) were feasible to obtain from foreign students, and (c) were most promising as variables to improve the interpretation of TOEFL scores and to enrich research on the candidate population.[1]

Data Collection

The basic data-gathering procedure for the study was a set of interviews with foreign students enrolled at four U.S. institutions of higher education. In order to decide what the most productive questions for these interviews would be, pertinent publications were examined (e.g., Althen, 1978, 1981; National Association for Foreign Student Affairs, 1978, 1981; Sharp & others, 1971; Wray, 1981), conversations were held with members of the TOEFL program staff, and letters were sent to various professional persons with special knowledge of foreign-student affairs--directors of foreign-student centers, professors of English as a Second Language, admissions officers and other administrators, and staff members of private and governmental agencies concerned with foreign students. (Members of the TOEFL research committee and Policy Council were among those contacted.) These letters described the project's objectives, indicated the kinds of questions that were being considered for inclusion in the interviews, and invited suggestions for

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[1]Funds for this study were provided by the research committee of the TOEFL program. Joan L. Borum, Willem C. Spits, Charles W. Stansfield, and other members of the TOEFL program staff furnished invaluable assistance at several points. The project also benefited from the work of Leta Davis as research assistant.

additional questions. Many suggestions were received, both for elaborations or refinements of questions already proposed and for new topics. On the basis of these explorations and inquiries, a draft interview instrument was drawn up and sent to the same individuals and a few others, asking for comments about the questions and also for suggestions for suitable interview sites. Of the 25 professionals who were sent letters in either the first or the second wave, or both, replies were received from 20 on either or both occasions.

On the basis of this work, a "final" interview instrument was prepared--though it was later modified in minor ways during the course of the interviews, as questions were found to be unproductive or as ways of clarifying them became evident. The questions were mostly of a semi-structured type. Those relevant to the present study dealt with the type, amount, and place of the interviewees' education; their contact with the English language, both in formal educational and in other settings; their experiences with TOEFL; their knowledge of other languages; and the amount of schooling their mothers and fathers had had.[2] In view of the special circumstances of foreign students, particular attention was paid, in framing the questions (and, later, in evaluating the responses), to the clarity and simplicity of the wording, the likely ability of the interviewees to give reliable responses, and the possible sensitivities of these students. During the interviews, special efforts were made to give students ample opportunities for asking

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[2] A few questions were also asked about respondents' motives for coming to the United States to study and about the source and kind of information they had had about higher education in this country. These questions were related to a possible future study of foreign-student applications and enrollments, and they will not be discussed in this report.

questions and stating opinions and to provide positive feedback, in order to overcome any hesitation about answering (Oksenberg & others, 1977). The interviews rarely required more than 30 minutes, and no serious difficulties were encountered in conducting them. A copy of the interview instrument in the last form in which it was used is reproduced as Appendix A.

The interviews were held between October and December, 1981, at Princeton University, Rockland Community College, Temple University, and the University of Maryland.[3] These institutions were selected not out of any effort to achieve "representativeness," but rather for the diversity of their student bodies, the closeness of their campus to the location of the project offices (in order to minimize the costs of the study), and the availability of a person on each campus who was willing to serve as a local contact for the study.[4] Each contact person was asked to recruit for the interviews about 20 students from non-English-speaking countries. They were all to have taken TOEFL within the past three years, and they were to be divided about evenly between males and females and between undergraduate and graduate students (if the institution enrolled any of the latter). The contact persons were told that we wanted to interview some students from each of five geographical regions--the Far East, the Middle East, Hispanic

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[3] Administrative officials were also interviewed at each of these campuses for their views on the problems of obtaining useful and reliable information from foreign students.

[4] I am happy to acknowledge the indispensable assistance of Nina Issawi, foreign-student adviser, and Judith P. Mackenzie, foreign-student admission officer, Princeton; Jonathan W. Lambert, coordinator of the Center for International Students, Rockland; Margaret Tisa, academic coordinator of the Intensive English Language Program, Temple; and Lois Lanier, Maryland English Institute.

America, Africa, and Western Europe. The contact person was sent a supply of one-page descriptions of the study to be given to prospective interviewees so that they could make an informed decision about whether to participate. The description stressed the voluntary and anonymous nature of participation and the fact that neither the decision about participation nor the students' responses if they did participate would have any effect on their student status.

The goal was to obtain interviews with a total of 75 students, but the goal was not met. At two of the campuses, fewer than 20 interviewees were recruited; the contact persons reported that the chief problems were not in obtaining students' consent to be interviewed but in locating them and in finding times that were convenient for them. At all the campuses, some students who were scheduled for an interview did not appear. Thus, by the time the data-collection phase of the study had to be ended, only 57 students had been interviewed.

Characteristics of the Sample

Of the 57 interviewees, 39 were undergraduates and 18 were graduate students; 37 were male and 20 were female, with the sexes distributed between undergraduates and graduates in virtually the same proportions. By geographic region, 11 came from Africa, 27 from the Far East, 7 from the Middle East, 3 from Europe, and 9 from Latin America. In all of these respects, the sample's composition was remarkably similar to that of the entire body of foreign students in the U.S. in 1979-80, the last year for which such data are available. The comparisons are shown in Table 1. Nevertheless, because of the way in which the sample was selected, no claim

Table 1

Characteristics of Sample and of All Foreign Students in the U.S.

Characteristic	Sample	All foreign students 1979-80[a]
Percent male	65	72
Percent undergraduates[b]	68	65
Percent who came from:[c]		
Africa	19	14
Asia (Far East & Middle East)	60	62
Europe	5	8
Latin America	16	16

[a]Source: Boyan (1981), pp. 3-4, 20, 22.

[b]Among students enrolled at two-year and four-year institutions.

[c]Excluding (from all foreign students) those from Canada and Oceania.

can be made for its representativeness in the statistical sense. All that is claimed--and all that was sought--is a high degree of diversity. Foreign students of many different kinds were among the interviewees.

Their diversity can be further seen in Table 2, which lists all of the countries named by one or more interviewees as their "native country." A comparison with the total foreign-student body is not possible, because the International Institute of Education, which conducts the annual census of foreign students, does not publish a comprehensive list of countries of origin. However, there is a point here that is worth noting. The IIE census asks campus officials to list the number of foreign students by "country of citizenship" (Boyan, 1981, p. 139). TOEFL candidates, on the other hand, are asked to give their "native country." Mindful of this difference, we asked interviewees both what they regarded as their native country and what their country of citizenship was. In all but eight cases, the two countries were the same. The exceptions were understandable and easily interpretable. Thus, one interviewee said Puerto Rico was her native country (and it is indeed included as a separate entry in the list of native countries given in the Handbook for TOEFL examinees), but she is of course a citizen of the U.S. Another insisted that Jerusalem was her native country (it is not included in the Handbook list), though she carries a Jordanian passport. A third referred to his native country as Namibia--the name used by many residents of Southwest Africa, which technically is a possession of the Union of South Africa. Thus, it would probably be valid in future research to compare data on TOEFL candidates' native countries with data

Table 2

Interviewees' Self-Reported Native Countries

Native country	Number of: Undergraduates	Graduate students
Africa	10	1
Algeria	-	1
Ethiopia	1	--
Ghana	2	--
Guinea-Bissau	2	--
Mauritius	1	--
Morocco	1	--
Namibia[a]	1	--
Nigeria	1	--
Somalia	1	--
Far East	16	11
China (People's Republic)	4	1
Hong Kong	2	--
India	1	5
Indonesia	1	--
Japan	2	--
Korea	1	--
Malaysia	3	1
Sri Lanka	--	1
Thailand	--	1
Taiwan	1	2
Vietnam	1	--
Middle East	5	2
Iran	--	2
Jerusalem[a]	1	--
Jordan	1	--
Lebanon	1	--
Saudi Arabia	1	--
Turkey	1	--
Europe	2	1
Greece	--	1
Hungary	1	--
West Germany	1	--
Latin America	6	3
Argentina	--	2
Chile	1	--
Haiti	1	--
Mexico	1	1
Panama	1	--
Puerto Rico[a]	1	--
Venezuela	1	--

[a]See text for explanation.

on IIE countries of citizenship.[5]

Because their score on TOEFL was so important a variable in this study, interviewees were asked for permission to obtain their score from institutional files. Most of them did give permission and then volunteered their score besides, sometimes even giving their scores from several administrations. (Interviewees had taken TOEFL 1.5 times on the average.)[6] When interviewees did give permission, the contact person at their campus was requested to report the score to us, and that request was met in all but a few cases where no score could be located in the files. When respondents did not give permission, it was usually because they said it wasn't necessary since they would give us their score themselves, and they proceeded to do so. When respondents did not give permission and did not volunteer their score, they were asked if they "would mind" giving us their score themselves. And when interviewees did give permission but did not volunteer their score, they were asked if they "happen to remember" what their score was. As a result of this series of questions, we had both institutional and self-reported scores for 29 interviewees, only institutional scores for 5, only self-reported scores for 16, and neither for 7 (of whom 2 said they had never taken TOEFL).[7]

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[5]In order to be sure that TOEFL candidates had a correct understanding of the term "native country," we asked them how they would explain it to another student from their own country. Virtually all of them answered with words like "the place where you were born," "where you grew up," or "where your parents (or your family) lived."

[6]Only total scores were sought, and interviewees rarely mentioned subscores.

[7]Chiefly as a rapport-building device, we also asked respondents for their opinions about TOEFL as a measure of their knowledge of English. Although their responses are not directly relevant to this study, they may nevertheless be of interest and so are discussed briefly in Appendix B.

In order to learn whether we could safely use self-reported scores when we did not have institutional scores, we compared the scores of interviewees for whom we had both kinds, using the most recent score where there was more than one from either source. The mean difference between them was barely ten points; the product-moment correlation was .94. We concluded that the self-reported scores were fully reliable, and we have used them in all subsequent analyses when an institutional score was not available.[8] It should be noted, however, that with the elimination of the seven candidates for whom we were unable to obtain a TOEFL score of any kind, the effective sample was reduced to 50. The mean score earned by these 50 interviewees was 529, with a standard deviation of 69, compared to a mean of 499 and a standard deviation of 67 among all candidates in 1978-80 (Test of English as a Foreign Language, 1981, p. 20). The highest score among the 50 was 670, the lowest 375.

Screening of Variables

In addition to the variables already mentioned, the interviews yielded information on about two dozen other variables which were of potential usefulness. They were:

[8]This is consistent with the finding of a study by Powers (1980). Foreign candidates who take the Graduate Management Admission Test are asked to give their TOEFL score if they have taken this latter test. Powers was able to locate actual TOEFL scores for 2,067 candidates who had reported a TOEFL score upon taking the GMAT between 1977 and 1979. He found the correlation between self-reported and actual scores to be .91.

General educational background[9]

Number of years attended school in home country

Last educational document/credential received in home country

Number of years of study completed in the U.S.

Type(s) of educational institution (if any) attended in the U.S. before enrolling at present institution

Number of years of education (if any) in countries other than home country and U.S.

Experience with the English language[10]

Number of years of formal study of English

Number of years of schooling in which English was the language of instruction[11]

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[9]Wherever variables in this and the next category involve numbers of years, the number referred to is the number of years prior to taking TOEFL (or prior to the most recent time it was taken, if it was taken more than once).

[10]A few respondents had attended a program of English as a Second Language (ESL) in a U.S. institution before earning their most recent TOEFL score, and in those cases their experience in the program was considered as part of their experience with English if the relevant information was available. Otherwise, however, the reference is to respondents' experience with English in their home country.

[11]Information for this variable was derived from interviewees' answers to questions about the kinds of schools in which they had studied English, whether their teachers spoke English in class, whether English-language books were used in their courses, and whether they had had any instruction in English in the U.S. (questions 2.1, 2.3, 2.4, 2.5, and 2.6 of the interview instrument). A year was counted as one in which English was the language of instruction only when (a) the interviewee was attending an educational institution in the U.S. or other English-speaking country, or (b) the interviewee was attending school in a non-English-speaking country (including, of course, the home country) but was studying a normal range of courses all of which were taught in English.

Number of hours per week in English class during last few years of schooling

Whether interviewee had had a job where English was used

Whether any members of interviewee's family knew English

Whether interviewee had had any friends who knew English

Whether interviewee had read English-language newspapers, magazines, or books (other than in school); and if so, how often

Whether interviewee had listened to English-language radio or television programs or had seen English-language films; and if so, how often

Whether interviewee had been in the U.S. or any other English-speaking country before enrolling in the institution presently being attended

Knowledge of other languages

Interviewee's native language

Languages other than native language and English that interviewee knew, and how they had been learned

Which languages respondents rated as their strongest and second strongest

Family background

Whether any brothers or sisters had attended school outside their native country

Country in which interviewee's father grew up

Number of years of father's schooling

Country in which interviewee's mother grew up

Number of years of mother's schooling

These, then, were the variables from among which selection would be made for recommendation to be included among the informational items to be obtained from TOEFL candidates in the future, in addition to those items already being obtained. It was clear from conversations with the TOEFL program staff that not more than three or four new items could be added, because of limitations on the space available on the test's answer sheet (and the probably unacceptably large costs that would be entailed by any expansion of the answer sheet). For purposes of this study, it was decided that, to be recommended for inclusion, an item should meet the following criteria: (1) It should lead to the creation of two or more reasonably well-populated categories (rather than to a set in which most or all candidates fell into the same category). (2) It should be readily understood and reliably answered by candidates from a wide variety of cultures, and it should not be offensive to any of them. (3) It should yield information on characteristics that would be useful in the interpretation of TOEFL scores in an institutional selection process. "Useful" characteristics would be those that were related to the scores in ways that were both plausible and statistically promising. Within this constraint, extra consideration would be given to characteristics that had a high probability of enhancing other kinds of research on TOEFL candidates and on foreign students generally.

Many of the variables failed to meet the first criterion. Very few of the interviewees had completed more than one year of study in the U.S. before taking TOEFL, even fewer had been in the U.S. before that for other purposes, and almost as few had received any education in countries beside the U.S. and their native country (and in nearly every case for less than a

year). On the other hand, the great majority of interviewees said that some or all of the other members of their family knew some English, and it did not seem feasible to distinguish among them on the basis of how many (or what proportion) of them knew English, much less on the basis of how well they knew it. All of the respondents had some friends who knew English, simply because they had all studied English in school and so they had classmates who knew English--though most interviewees said they had never used English with their friends outside the classroom. All but a few listened frequently or regularly to English-language radio and/or TV. The fathers and mothers of nearly all the interviewees had grown up in the same country as their children.

TOEFL candidates are already asked for their native language, so there is no need to consider it as a possible additional item.[12] About 60 percent of the interviewees said they knew at least one other language; the "other" languages spoken by the interviewees of each native language are shown in Table 3. The variety of these other languages, the number of different combinations with native languages, and the variations in degree of fluency are so great that this could hardly be made into an interpretable variable. Most interviewees said that their native language was their strongest one. Often, the second strongest was another language common in their native country (e.g., Chinese in Malaysia, Hindi for speakers of several Indian

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[12]For the same reason that we asked interviewees how they would explain "native country," we also asked them how they would explain "native language." Nearly all the responses fell into one (or more) of three categories: the language you first learned (or the language of your childhood), the language spoken in your home (or by your parents or family), or the language of your native country.

Table 3

Interviewees' Native Languages and Other Languages Spoken[a]

Native language	Number of interviewees giving this as their native language	Number of interviewees saying they knew at least one other language[b]	Other languages known[b]
Akan	1	--	- - - - -
Amharic	1	1	French
Arabic	5	3	French, Russian
Bengali	1	1	Hindi
Chinese	11	5	German, Japanese, Russian
Creole	1	1	French, Portuguese
English	1	1	French, German, Hindi
Farsi	2	1	Turkish
French	2	1	Arabic, Creole, Russian, Spanish
German	1	1	French, Italian
Greek	1	1	French, Italian
Hungarian	1	--	- - - - -
Indonesian	1	--	- - - - -
Japanese	2	1	German
Konkoni	1	1	French, German
Korean	1	1	Japanese
Malay	4	2	Chinese
Oriya	1	1	Assamese, Bengali, Hindi
Pape	1	1	Creole, Portuguese, tribal languages
Somali	1	--	- - - - -
Spanish	8	4	French, Hebrew, Italian
Tamara	1	1	Afrikaans, German, tribal languages
Tamil	1	1	German, Sinhalese
Telegu	2	2	French, German, Hindi, Kannada

Table 3 (Continued)

Interviewees' Native Languages and Other Languages Spoken[a]

Native language	Number of interviewees giving this as their native language	Number of interviewees saying they knew at least one other language[b]	Other languages known[b]
Thai	1	1	Chinese, German
Turkish	1	--	- - - - -
Twi	1	1	French, German
Vietnamese	1	1	Chinese
Yoruba	1	1	French, Spanish
Totals	57	35	

[a]Names of languages are those given by respondents. Some of these names are not in the TOEFL Handbook for examinees.

[b]Excluding English and languages currently being studied, and without regard to degree of fluency.

languages), and interviewees had learned it virtually simultaneously with their native language.

Two other variables were dropped because they seemed neither reliable nor valid. Interviewees had considerable difficulty naming for us the last educational document or credential they had received. The name was often in a foreign language for which they did not know an equivalent term in English. In some cases it appeared that they were not even sure that they had received a document from the last institution they attended; or if they had, exactly what it was called. Interviewees also had difficulty recalling the number of hours per week they had spent in their last English class, and it was clear from the way they responded that they were giving us only vague approximations. The number of hours may well have varied over the last few years of school, or even within the school year, and some interviewees had evidently not studied English as a separate subject at all during at least their last year of school. (This included some for whom English was the language of instruction, and to classify them as having had no hours of English during the last year would obviously be misleading.) This variable had been included in the belief that number of hours per week might be a better predictor of language achievement than number of years in which English-language courses had been taken. However, what <u>happens</u> during those hours is probably even more important and is still highly variable. Consequently, number of hours may not really contribute much to the interpretation of a score beyond what is already known from knowing number of years. Finally, number of hours is more likely to be standardized within the educational system of a given country than is number of years (i.e., students may elect to study English, or another foreign language, and to study it for a varying number of years, but once they have made their choice for a

given year, the curriculum for that year will, in many places, be more or less prescribed), so that future research may be able to use number of years of study of English together with native country to achieve more precise measurement of the amount and quality of instruction in English that students have had.

Exploration of Relationships

The screening process left us with nine new variables whose association with TOEFL scores could be explored. Because of the purpose of this study and the small size and non-random nature of the sample, the use of powerful and rigorous statistical tools for the testing of hypotheses was deemed both unnecessary and inappropriate. Instead, we made use mainly of the techniques of exploratory data analysis (Hartwig, 1979; Tukey, 1977), which rely heavily on such relatively robust measures as the median and the interquartile range (or "midspread") to describe variables and on median traces (analagous to regression lines) to examine relationships between variables. Only after these preliminary explorations had been completed did we proceed to regression analysis.

Before the effects of any of the new variables on TOEFL scores could be studied, it was necessary to consider the likelihood that many, even most, of them would be related to the inverviewees' educational status--i.e., whether they were in the U.S. as undergraduates or as graduate students--and that educational status would in turn be related to TOEFL score. If this were the case, then variables that appeared to be related to TOEFL score might be so only as an artifact of their simultaneous relationship to educational status. The median score for the 33 undergraduates for whom

we had scores was 510; for the 17 graduate students, 580 (with midspreads of 66 and 87, respectively)--obviously a difference large enough to require that educational status be used as a control in all further analysis.[13] The distributions of these undergraduate and graduate-student interviewees on the nine new variables, and the median scores for persons in each category, are shown in Tables 4 and 5.

Three of the new variables were qualitative: the type of educational institution previously attended in the U.S., whether the interviewee had had a job where English was used, and whether any brothers or sisters had attended school outside their native country. None of these seems to be a very promising variable. Variation by type of U.S. institution attended was small and irregular. Among undergraduates, the highest median score was attained by those who had not attended a U.S. institution at all--a result that is contrary to what would reasonably be expected, though it may reflect a relatively greater degree of selectivity in the admission of applicants in this category.[14] The differences between interviewees who had held a job where English was used and those who had not were small and in opposite directions for undergraduates and graduate students. It might be thought that the effectiveness of this variable could be improved by asking not merely whether candidates had a job where English was used but also how much English was used and/or for how long the candidate had had such jobs--but it is unlikely that the answers to these additional probes

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[13] Within educational status, median scores of men and women were virtually identical: 511.5 and 510, respectively, among undergraduates; and 580 and 575 among graduate students.

[14] Using data for all degree-seeking candidates who took TOEFL between 1977 and 1979 (N = 235,738), Wilson (forthcoming, [a]) made the similar--and equally surprising--finding that candidates who took the test at a testing center abroad tended to earn higher scores than those who took it in the U.S.

Table 4

Distributions and TOEFL Scores of Undergraduate and Graduate-Student Interviewees on Four Potentially Useful Qualitative Variables

	Number of:		Median score of:	
	Undergraduates	Graduate students	Undergraduates	Graduate students
Type of U.S. educational institution previously attended[a]				
None	10	11	560	570
Secondary school	8	--	495	---
ESL program	9	3	500	593
College or university	6	3	501	580
Whether respondent had had a job where English was used				
Yes	12	8	508.5	575
No	20	8	513	561.5
No answer	1	1	---	---
Whether brothers or sisters had attended school abroad				
Yes	18	5	511.5	547
No	15	12	510	591.5
Read English-language newspapers, magazines, or books				
Yes, frequently	9	7	553	590
Yes, occasionally	13	5	510	580
No	11	4	461	541.5
No answer	--	1	---	---

[a]Respondents who had attended more than one type were classified according to the type at the highest level attended.

would be very reliable. The difference between those who did and did not have brothers or sisters who attended school outside their native country was very small for undergraduates; and while it was quite large among graduate students, it was in a direction that is contrary to common-sense expectations.[15]

The relationship between TOEFL score and the reading of English-language newspapers, magazines, or books, however, was clear, strong, and plausible. In asking this question, we tried to obtain from the interviewee an estimate of the frequency of such reading. Those who said they engaged in it three hours a week or more were classified as "frequent" readers of English-language materials; those who said they generally spent less than three hours a week at it were classified as "occasional" readers. However, many interviewees were understandably hesitant about giving an answer in terms of hours, but they were almost always able to say whether it was something they did on a regular basis (e.g., "I subscribed to Time magazine and read it nearly every week") or something they did only sporadically or when an opportunity happened to present itself; the former were classed with the "frequent" readers and the latter with the "occasional" ones. When the respondents were categorized that way, the frequent readers had higher median scores than the occasional readers, and the occasional readers had higher median scores than those who did not read English-language materials at all; and this was true among both undergraduates and graduate students, with the difference between the highest and the lowest categories being 92 points among the former and 48.5 points among the latter. This

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[15] Most of the siblings who had attended school outside their native country had done so in the U.S. or Great Britain.

question surely commends itself for consideration as a new item of background information.

As a result of the findings up to this point, and in order to facilitate further analysis, the TOEFL scores were re-expressed in the following way: Interviewees were categorized according to their educational status and English-language reading simultaneously. They were then given new scores, equal to the deviation of their original score from the median score of all respondents in their category.[16] Since -135 was the largest negative deviation of these new scores, 135 was added to each score for the sake of eliminating negative scores. Finally, in order to bring the distribution of the scores closer to symmetry (and thus minimize the possibility that a skewed distribution would obscure relationships between TOEFL scores and other variables), they were transformed by the equation

$$\text{RTOEFL} = \left(\frac{\text{DTOEFL} + 200}{20}\right)^2,$$

where DTOEFL is the deviation plus 135 points and RTOEFL is the new score to be used in the remainder of the analysis. (The numbers 200 and 20 were chosen because they seemed to maximize the symmetry of the resulting distribution. Further details on this transformation are given in Appendix C.) RTOEFL ranges from 100 to 486, with a median of 281 and a midspread of 147. The effect of this transformation is that educational status and frequency of reading English-language materials no longer account for any differences among interviewees' scores that we may find.

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[16]The one interviewee--a graduate student--who did not give us sufficient information about reading of English-language materials was assigned a score equal to the deviation of his score from the median for all graduate students.

The distribution and RTOEFL scores of the interviewees on the five quantitative variables are given in Table 5. The fact that number of years of education (prior to earning the most recent TOEFL score) was unrelated to RTOEFL score except at the extremes is not surprising, since it is chiefly a function of educational status: The median number of years for undergraduates was 13 and for graduate students 17, with midspreads of only 3 and 4 years, respectively. The median trace of RTOEFL score against this variable produced an essentially flat line.[17] Thus, this variable would seem to provide little interpretive help beyond what could be derived from educational status.

Total number of years of formal study of English, on the other hand, appears to be a quite promising variable. It showed a steady and substantial rise in scores between each pair of intervals except the first. Examination of the scatterplot of these two variables against the regression line of their relationship (estimated RTOEFL = 228.8 + 6.03 [number of years of study of English]) revealed one clear outlier: a man who had studied English for only 1.5 years (in an ESL program in the U.S.) but had attained a TOEFL score of 600 (RTOEFL = 387). This man was among the oldest of our interviewees and was evidently a person of very unusual abilities. He had already mastered three other languages in addition to his native language,

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[17] In this and all other instances, the median trace used intervals finer than those shown in Table 5 (which were set only for convenience of presentation) and employed the smoothing techniques described in Hartwig (1979) to minimize the effects of small numbers of cases in each interval.

Table 5

Distributions and RTOEFL Scores of Interviewees

on Five Potentially Useful Quantitative Variables

	n	Median RTOEFL score
Number of years of prior education		
less than 12	5	254
12-13	15	284
14-15	9	281
16-17	11	281
18 or more	10	303
Number of years of formal study of English		
1-4	9	281
5-8	15	264
9-12	12	281
13-16	10	292
17 or more	4	410
Number of years of schooling in which English was language of instruction		
0.0 - 0.9	17	276
1.0 - 1.9	9	289
2.0 - 2.9	5	284
3.0 - 3.9	1	216
4.0 - 4.9	7	303
5.0 or more	11	281
Number of years of father's education		
0-4	6	314.5
5-9	9	254
10-14	11	281
15-19	16	286.5
20 or more	4	311
No answer	4	---
Number of years of mother's education		
0-4	8	252
5-9	13	254
10-14	11	281
15-19	14	311.5
20 or more	1	284
No answer	3	---

had received a bachelor's and a master's degree in a country where his native language was not spoken, and had held a highly responsible position as a civil servant in his government. In view of these rather special circumstances, he was excluded from the rest of the analysis (though he is included in the other parts of Table 5). With that exclusion, the median RTOEFL score for persons with 1-4 years of formal study of English was reduced to 269.5.

The number of years of formal study of English included the years during which English was the language of instruction, but the number of years of the latter kind was also looked at as a separate variable, on the ground that each such year might contribute more to a person's knowledge of English than a year in which English was simply one subject of study among many. The trend of scores shown in Table 5 does not give much support to that idea. (Elimination of the interviewee mentioned above improved the picture somewhat: The median RTOEFL score in the category of persons with 1.0-1.9 years during which English was the language of instruction dropped to 276.5.) We experimented with various ways of devising and combining two measures of study of English--e.g., using number of years of schooling in which English was the language of instruction and number of years of <u>other</u> formal study of English, giving double weight to each year in which English was the language of instruction, re-expressing the measures in an effort to give them greater symmetry--but none of these manipulations produced a stronger relationship with RTOEFL than simply the straightforward measure, total number of years of formal study of English. Nevertheless, it should be remembered that the sample we were working with is small and non-random. It is possible that, with a larger and more representative sample of TOEFL

candidates, two measures of the amount or type of study of English might be found that would be substantially more helpful in interpreting the scores than simply total number of years of formal study. It does seem prudent, however, to be sure that, whatever questions are asked, the answers make it possible to obtain a measure of total number of years of formal study.

Number of years of father's and mother's schooling was included as a measure of socioeconomic background or status (SES), one of the most fundamental variables in educational and social-science research because of its pervasive effects on every aspect of human development and social life.[18] Parental occupation, rather than education, is perhaps the single most widely used index of SES, but its use in the TOEFL context seemed questionable. Occupational structures vary considerably among different nations, especially among nations at different stages of economic development.[19] Furthermore, it would be quite difficult to frame a question about parental occupational status that would be clear enough to assure useful responses, if only because the English words used to translate even the "same" occupation differ from one country to another. A detailed list of occupations would not be practicable, yet a brief list of occupational categories would leave uncertainties about the content of each. Finally, when occupational

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[18] For a summary of the literature on these effects, see Vanfossen (1979).

[19] For a vivid illustration of the magnitude of the problems involved in establishing occupational categories that are comparable across countries, see Treiman (1977). While Treiman achieved remarkable results, he used data from only 51 countries, whereas TOEFL candidates come from about 150, and on some countries he had information on as few as a dozen occupations, so his problem was relatively "small"--yet his description of the methodological difficulties he had to deal with makes it clear that it would be prohibitively expensive to do anything similar on a regular basis.

status is used as a measure of SES, there is the troublesome problem of the mother's status: If it is not asked for, it raises questions about equity and may also mean a loss of valuable information; yet if it is asked for, difficult decisions have to be made about classifying mothers who do not have paid employment (not to mention the issue of cross-cultural differences in the sex compositions of occupations). Use of family income as an SES measure would have encountered even thornier problems of currency equivalents, the significance of family size and age composition, and the varying meaning of cash income.

The use of parental education avoids many of these difficulties. "Schooling" is a widely recognized English word, with reasonably similar meaning everywhere, and a year is a universally accepted unit for measuring how much of it one has had. The question needs neither a detailed checklist nor a set of summary categories; it can be asked open-ended, since the use of numbers is, again, universal. It is possible for both father and mother to have it, and to have it in independent amounts, and zero years has an interpretable meaning for both of them. None of our interviewees had any difficulty in understanding our question; a few said they could not remember, but that would probably be as much of a problem with any other SES question.

Of course, there remains the question of whether father's or mother's education can contribute anything to an explanation of TOEFL scores beyond what would be gained from the use of the other variables that we have considered so far. Table 5 does indicate that the education of each parent was clearly, though not perfectly, related to RTOEFL scores. (Elimination of the "outlier" interviewee discussed above did not materially change these

relationships.) RTOEFL scores, it should be remembered, are already free of the influence of educational status and reading of English-language materials, variables which could well be related to parental education. However, it would be reasonable to expect that father's and mother's education were related to each other and that they were in turn related in some way to total number of years of formal study of English.[20]

Father's and mother's education were indeed related to each other, though not so strongly as to suggest that they were interchangeable variables. The coefficient of determination (R^2) of their relationship was .525--i.e., a little more than half of the variation in one could be accounted for by the variation in the other.[21] Neither of them, however, was related to years of study of English; R^2 for mother's education was zero, and for father's .005. What all of this suggests is that the three variables have independent importance.

Further analysis confirmed that conclusion, and yielded one interesting and unexpected finding. Years of study of English, father's education, and mother's education each were related about equally strongly to RTOEFL scores; the respective coefficients of determination were .10, .09, and .13. When RTOEFL scores were expressed as deviations or residuals from the regression of RTOEFL on years of study of English, in order to remove the

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[20]The distributions of parental education shown in Table 5 strongly suggest that the parents of TOEFL candidates are disproportionately drawn from the well-educated strata of their respective countries, although no precise comparison was possible within the scope of this study.

[21]A median trace of the relationship showed it to be virtually linear, so that the R^2 would not be increased by re-expressing the variables or by searching for some sort of nonlinear function.

effect of the latter on the former, R^2 for father's education and these residuals dropped, but only slightly, to .07, while R^2 for mother's education actually went up somewhat, to .16. Finally, when the effect of both years of study of English and father's education were removed by the same technique, mother's education still showed an R^2 of .05--a value high enough, especially in view of the nature of this sample, to suggest that mother's education should definitely be considered for inclusion among the new items of background information to be sought. Indeed, it appears to be even more important than father's education,[22] though it would probably seem peculiar and might lose potentially valuable information if mother's education were asked for and not father's.

Conclusions

From the sifting through of some two dozen variables that might be added to the background information collected from TOEFL candidates, four variables emerged as being the most promising: total number of years of formal study of English; reading of English-language newspapers, books, and magazines; number of years of father's education; and number of years of mother's education. Each of these was easily asked for and readily responded to, and each was independently related to TOEFL scores, in the interpretation of which they would probably find their most immediate use.

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[22]This was not because, as might be thought, mother's education was a more differentiated variable than father's. Midspreads for the two were nearly equal--10 and 9.5 years, respectively (and so, for that matter, were the standard deviations--5.77 and 5.68, respectively).

Collectively, they offer the promise of enhanced research on various aspects of the TOEFL candidate population and on foreign students generally. For example, they could be used in studies of the effects on success in college of knowing the language (much formal study but low reading of English-language materials at a given level of TOEFL scores) vs. knowing the culture (same level of TOEFL score but less formal study and more reading of English-language materials). Parental education, as a measure of socioeconomic background, would be important to control in this and many other sorts of research, and its own effects and its effects in interaction with other variables (e.g., native country) would also be important issues for investigation.

Moreover, this would be an opportune time for introducing new background items.[23] In accordance with a recent decision of the TOEFL Policy Council, the number of institutions that candidates may designate as score recipients has been reduced from four to three. Each institutional designation requires a six-column field: four for the institutional identifying code and two for a departmental code (used by graduate students). Thus, four of the newly freed columns could be used for parental education (two each for father and mother, asked in open-ended fashion); one for reading of English-language materials (in checklist form: e.g., "At least once a week," "Only occasionally," and "Never"); and one for years of formal study of English (asked in open-ended form

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[23]The information which follows was kindly provided by the TOEFL program staff.

but with the lowest and highest responses--e.g., less than 5 years and more than 13--collapsed into single categories so that not more than one column would be required).[24] These questions could be added without change in the answer sheet and with only minor other costs, such as the one-time cost of changing the candidates' handbook to include the new questions. Since the resulting information would be processed in conjunction with the processing of the rest of the information on the answer sheet, additional processing costs would also be hardly noticeable. In short, the opportunity presents itself for a substantial and valuable addition to the stock of information about TOEFL candidates for very little expense.

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[24] If additional space could be found on the answer sheet, number of years of formal study of English might be broken down into number of years in which English was studied as a subject and number of years in which it was the language of instruction.

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APPENDIX A

INTERVIEW QUESTIONS FOR STUDENTS WHO HAVE TAKEN TOEFL

As you probably know, I am doing a study for the sponsors of the Test of English as a Foreign Language. They would like to learn more about the students who take their test, so that they can improve their services to students in the future. As part of this study, we are asking students from different countries some questions about their educational background. We have tried to make the questions clear, but if any of them are not, please stop me and I will try to explain them better. This interview is not a part of your studies here, and your answers will not affect them in any way. In fact, your answers will not be communicated to any person at this (college, university), and they will not be reported anywhere in any way that will allow you to be identified. So I hope you will do your best to answer every question. However, if there is any question that you do not <u>want</u> to answer, simply tell me that and I will go on to the next one. I expect that we will be finished in about 30 minutes, but if you have to leave sooner for any reason, you are free to do so. Is all of that clear, so that we may begin the interview? [Pause] [Add, if necessary:] Am I perhaps speaking too fast? [Pause]

1.0 First, would you tell me whether you are a graduate student or an undergraduate.

1.1 And is this your first year at (name of college) or your second?

1.2 O.K, good. Now, what country were you living in just before coming to ~~this~~ (name of college)?

1.3 How many years did you attend school in (that country)?

IF NONE: 1.3.1 What country were you living in before that?
[Then repeat question 1.3.]

1.4 What type of school was the last one you attended?
[Probe to find out whether it was at secondary or postsecondary level, and if latter, whether it was university, technical, teacher-training, or other type of institution.]

1.5 Did you receive some sort of document upon completing that school?

IF YES: 1.5.1 What was it called?
[Get English translation if necessary.]

1.6 Had you ever attended a school in the United States before coming to (name of college)?

IF YES: 1.6.1 Would you please tell me about that?
[Find out educational level, length of time, and R.'s satisfaction with ability to use English.]

1.7 Have you ever attended school in any country beside (answer to 1.3 or 1.3.1) and the United States?

IF YES: 1.7.1 Would you please tell me about that?
[Find out where, how long, and educational level.]

1.8 Do you expect to receive a degree in the U.S.?

IF YES: 1.8.1 What degree, and in what field?

1.8.2 Do you expect to receive it here, at (name of college), or do you think you might transfer some time?

UNLESS EXPECTED DEGREE IS PH.D.

1.9 Do you expect to continue your studies at any other college or university, here or anywhere else?

IF YES: [Probe for details.]

2.0 Next, we would like to find out more about how and where students from other countries have learned English. Could you tell me, first, how many years you studied English in school before coming to the U.S.?

2.1 In what kind or kinds of schools did you study English?

[If necessary, explain: primary, secondary, college-level; schools operated by the government; schools operated by a religious groups; schools not operated by either the government or a religious group. Record any other characteristics given--e.g., one-sex or coeducational, urban or rural, large or small, etc.]

2.2. During your last few years in school, about how many hours a week did you spend in your English class?

2.3 Did your teachers speak English in class most of the time?

2.4 Did you have any other courses in which the teacher spoke English in the classroom most of the time?

2.5 Did you use English-language books in any of your courses--that is, beside your English courses?

2.6 Have you had any instruction in English here in the U.S.?

IF YES: [Get details.]

2.7 Have you had any formal instruction in English beside what you have told me about so far--for example, have you had any private tutoring, or attended a school in another country, or listened to courses on radio or television, or anything else?

IF YES: [Ask for specifics parallel to those in 2.1-2.5.]

2.8 Have you ever had a job where you used English?

IF YES: [Ask for specifics: nature of the job, how English was used.]

2.9 Does anyone in your family beside yourself know English?

IF YES: [Ask for specifics: Who they were, whether they ever used English with R.]

2.10 Before coming to the U.S., did you have any friends who knew English?

IF YES: 2.10.1 Did you ever speak English with these friends?

2.11 Before coming to the U.S., did you read any English-language newspapers, magazines, or books, besides those you read in school?

IF YES: [Ask for some examples and an estimate of frequency.]

2.12 Were you ever able to listen to English-language radio broadcasts or television programs or see English-language films?

IF YES: [Ask for some examples and an estimate of frequency.]

2.13 Had you ever been in the U.S. before coming to this (college, university)? [Add, if necessary:]...beside the time you have already told me about?

IF YES: [Ask when previous visit(s) took place, how long they lasted, what the nature of the activities were, and how satisfied R. was with ability to use English.]

2.14 Had you ever been in any <u>other</u> country where English was the language spoken by most of the people?

IF YES: [Ask what countries, when, how long, what were the activities and, if necessary, how satisfied R. was with ability to use English.]

3.0 I believe that you took the Test of English as a Foreign Language, or TOEFL, before you enrolled here at (name of college). Is that correct?

IF NO: 3.0.1 Did you take <u>any</u> test of your knowledge of English?

IF NO: [Skip section 3 and go on to section 4.]

IF YES: [Probe to be sure it wasn't TOEFL--e.g., ask who made the test, who published it, who sent the scores. If you are reasonably sure it <u>was</u> TOEFL, ask the rest of the questions in section 3 without using the TOEFL name. If you are not it was TOEFL, or are sure it was <u>not</u> TOEFL, skip section 3 and go on to section 4.]

3.1 Did you take it just once or did you take it more than once?

IF MORE THAN ONCE: 3.1.1 How many times did you take it?

3.1.2 Do you remember when those times were? [If possible, get answer in terms of both year and stage of educational career.]

3.1.3 What were your reasons for taking it each of those times?

[If necessary, preface the next question with:] Thinking now about the <u>last</u> time you took TOEFL before coming to this (college, university)...

3.2 Do you think that the test was a good measure of how well you knew English at that time?

IF NO: 3.2.1 Why do you think it wasn't? How do you think the test could be made better?

3.3 Would it be all right with you if I asked (person who arranged the interview) what your score on the test was?

IF R. VOLUNTEERS SCORE: O.K., thanks very much. [Go on to 3.4.]

IF NO [i.e., R. declines permission]: 3.3.1 Would you mind giving me your score yourself?

IF YES: [Be sure you have R.'s name, then ask:]
3.3.2 Do you happen to remember what your score was?

3.4. When you took the TOEFL, you were asked what your "native country" was. Do you remember what country you named in answer to that question?

IF NO: [Ask R. how he/she would answer the question now, and rephrase the following questions accordingly.]

3.5 Are you also a citizen of (that country)?

IF YES: 3.5.1 If a student from (answer to 3.4) were to ask you what "native country" means, how would you explain it?
3.5.2 Why did you answer (native country) to the question rather than (country of citizenship)?

3.6 When you took the TOEFL, you were also asked what your "native language" was. Do you remember what language you gave in answer to that question?

IF NO: 3.6.1 Well, how would you answer that question if someone asked you it now?

3.7 Again, if a student from (answer to 3.4) were to ask you what "native language" means, how would you explain <u>that</u>?

3.8 Have you taken any other standardized tests beside the TOEFL either before coming to the United States or since you've been here?

IF YES: 3.8.1 Could you tell me what they were?
[Probe to learn reasons for taking.]

IF NO OR UNSURE: [Ask about specific tests--SAT, GRE, GMAT.
IF YES to any of these, probe to learn reasons for taking.]

[NOTE: SECTION 4 MAY BE OMITTED IF INTERVIEW TIME IS GROWING SHORT.]

4.0 Do you know any languages other than (native language) and English?

IF YES: 4.0.1 Which other languages do you know and how did you learn them?

4.1 Which would you say is your strongest language, the one you know best and are most comfortable with?

[IF R. KNOWS MORE THAN TWO LANGUAGES]:

4.2 Which would you say is your next strongest?

5.0 Would you tell me your main reasons for coming to the United States to study rather than studying in your own country or another country?

5.1 How did you learn about colleges and universities in the U.S.? Where did you get that information from?

5.2 How many colleges or universities in the U.S. did you apply to?

5.3 Why did you decide to come to this particular (college, university)?

5.4 Do you feel now that you made the right choice?

IF NO: 5.4.1 Why not?

5.5 If you were talking to students in (R.'s native country), what are the two or three most important things about colleges and universities in the U.S. that you would like to tell them?

6.0 This is the last set of questions. Could you tell me a little about your family? For example, how many brothers and sisters do you have?

IF NONE: [Skip to question 6.1.]

6.0.1 Has any of them gone to school in a country other than (R.'s native country)?

IF YES: 6.0.1.1 Would you tell me about that?
[Probe to learn country, level of study, and length of time.]

6.1 What country did your father grow up in?

6.2. How many years of schooling has your father had?
[Probe to learn countries in which father was educated.]

6.3 Would you say that (that number of) years of schooling is about the same as most men of his age in (R.'s native country) have had, or more than most, or less than most?

6.4. And your mother--what country did she grow up in?

6.5 How many years of schooling has she had?
[Probe to learn countries.]

6.6 And would you say that (that number of) years is about the same as most women of her age in (R.'s native country), or more than most, or less than most?

7.0 Those are all the questions that I have. Is there anything else about your education, your study in the U.S., or the TOEFL that you think it is important for me to know or that you would like to tell me, that we haven't talked about so far?

Thank you very much for coming by and taking the time to talk to me. The report of the study for which this interview was done will be ready next March or April, and we will send a copy to the (office which arranged the interviews) so that you can read it if you're interested. Thanks again, and good luck in your studies!

APPENDIX B

INTERVIEWEES' COMMENTS ON THE TEST OF ENGLISH AS A FOREIGN LANGUAGE

Partly as a rapport-building preface to inquiring about their TOEFL scores, we asked the interviewees, wherever appropriate, "Do you think that the test was a good measure of how well you knew English at that time?" (i.e., at the time the test was taken). Two interviewees had not taken TOEFL, and in eight other instances the interview situation did not lend itself to asking the question. Of the remaining 47 interviewees, 18 simply said they thought it had been a good measure. The rest were asked follow-up questions: "Why do you think it wasn't [a good test]? How do you think the test could be made better?" These 29 interviewees--of whom 13 said it was not a good measure and 16 said they were not sure or it was all right in some ways but not in others--made a total of 53 comments about TOEFL and the experience of taking it.

Almost half the comments (24) revolved around the difficulty level of the test. Six interviewees said the listening comprehension section was hard, two singled out the reading comprehension section, four the vocabulary, and two simply said the test was hard "in general." Related to these comments were five others that raised objections to the specifically "American" nature of the test--in the accent on the tapes for the listening comprehension section, the vocabulary of either the listening or the reading comprehension section, or the content of the items. On the other hand, ten interviewees said they thought the test was easy, even "ridiculously

easy, and four of them mentioned the listening comprehension part as having been especially easy.[1]

The second most frequently occurring type of complaint dealt with the conditions under which the test was taken (9 interviewees). The listening comprehension tapes again came in for criticism; it was said that they were hard to hear, because either the player or the tape itself was defective, or because there was too much noise in the testing environment. A few interviewees felt that there had been inadequate supervision in the test room, leading to disorder and (some suspected) providing opportunities for cheating.

The rest of the complaints were directed at a wide variety of targets: the test was too general or it was too specific, the answer sheet was hard to understand, there was too much emphasis on fine points of grammar, or--reminding us that the U.S. and the rest of the world have much in common--the multiple-choice format is too constricting.

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[1] Several interviewees spoke English quite fluently; indeed, as Table 3 showed, one even said that English was his native language. This raises the question of why they were asked to take TOEFL at all. A typical institutional rule is that of the University of Maryland, which requires a TOEFL score from all applicants except (a) native speakers of English, defined as "those born and educated in the U.S., English-speaking Canada, United Kingdom, Ireland, Australia, New Zealand, or Commonwealth Carribbean," and (b) non-native speakers of English "who have received a tertiary degree" in one of those countries or regions. Thus, a TOEFL score was required of applicants from countries like India, Malaysia, Singapore, Israel, and Nigeria, where English may have been the language of school instruction and even of the family. When asked about this, admissions and foreign-student personnel admitted that some applicants argued that having to take TOEFL was almost an affront, but their response was that the test need not cause anxiety to applicants who knew English well while it did protect the institution--and indeed the applicant as well--from a situation in which a student would be permitted to enroll only to find that he or she was unable to keep up with the academic work because of a lack of facility in English--and the applicant was not necessarily a good judge of whether that was likely to occur.

Appendix C

DERIVATION OF THE RTOEFL SCORES

As pointed out in the text (p. 22), it was desirable, for purposes of further analysis, to eliminate the effects on TOEFL scores of educational status and prior reading of English-language materials. This was accomplished by classifying students according to whether they were undergraduates or graduate students, and according to whether they had been frequent readers of English-language materials before taking TOEFL, or occasional readers, or non-readers; determining the median for each of the six resulting categories; and calculating a new score, DTOEFL, which was the algebraic difference between a score and the median of the category in which it fell, plus 135 (this latter for the sake of avoiding negative scores). Because this procedure expressed each score as the deviation from one of six "local" medians, the result was a narrow and highly peaked distribution; DTOEFL scores ranged from 0 to 241 (compared to the TOEFL range, in this sample, of 375 to 670, or 295 points), and almost half the cases (22) were between 100 and 150. Furthermore, the scores were skewed toward the lower end of the range; there were 106 points between the median of the total distribution (which was, of course, 135) and the highest score, but 135 points between the median and the lowest score.

Because a distribution departing that far from normality could distort or conceal relationships between the scores and other variables,

the DTOEFL scores were transformed into RTOEFL scores, by the formula

$$\text{RTOEFL} = \frac{\text{DTOEFL} + 200^2}{20} .$$

The terms in this formula have no intrinsic significance; they were chosen because they seemed to be most effective in achieving normality of the score distribution.

The RTOEFL scores range from 100 to 486, a range that is 145 points greater than that of the DTOEFL scores. The maximum number of cases in any single 50-point interval is reduced to 18, and the distances between the median (281) and the extreme scores are more nearly equal (181 and 205). The distribution of RTOEFL scores is thus a better approximation to normality.

A complete roster of TOEFL, DTOEFL, and RTOEFL scores for the sample is given in Table C-1.

TABLE C-1

TOEFL, DTOEFL, and RTOEFL Scores of Undergraduate and Graduate Student Interviewees by Frequency of Prior Reading of English-Language Materials

	TOEFL	DTOEFL	RTOEFL
		UNDERGRADUATES	
		Frequent Readers	
	653	235	473
	630	212	424
	617	199	398
	600	182	365
	553	135	281
	513	95	218
	507	89	209
	480	62	172
	467	49	155
Median	553	135	281
		Occasional Readers	
	600	225	452
	533	158	320
	523	148	303
	520	145	298
	520	145	298
	515	140	289
	510	135	281
	510	135	281
	507	132	276
	500	125	264
	500	125	264
	495	120	256
	375	0	100
Median	510	135	281

TABLE C-1 (continued)

	TOEFL	DTOEFL	RTOEFL
		Non-Readers	
	567	241	486
	540	214	428
	520	194	388
	513	187	374
	463	137	284
	461	135	281
	447	121	258
	445	119	254
	425	99	224
	420	94	216
	377	51	158
Median	461	135	281
		GRADUATE STUDENTS	
		Frequent Readers	
	670	215	431
	663	208	416
	603	148	303
	590	135	281
	513	58	166
	480	25	127
	467	12	112
Median	590	135	281
		Occasional Readers	
	593	146	299
	580	135	281
	580	135	281
	547	102	228
	543	98	222
Median	580	135	281

TABLE C-1 (continued)

	TOEFL	DTOEFL	RTOEFL
		Non-Readers	
	600	193.5	387
	570	163.5	330
	513	106.5	235
	470	63.5	174
Median	541.5	135.0	281
		No Information about reading	
	647	202	404